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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,131	07/31/2003	Laurel H. Carney	156 P 023	2472
28264	7590	09/09/2005		
BOND, SCHOENECK & KING, PLLC ONE LINCOLN CENTER SYRACUSE, NY 13202-1355			EXAMINER NATALINI, JEFF WILLIAM	
			ART UNIT	PAPER NUMBER
			2858	
DATE MAILED: 09/09/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/631,131

Applicant(s)

CARNEY ET AL.

Examiner

Jeff Natalini

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/31/03 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being obvious over "A New Angle on Detection: A Physiological Model for the Detection of Tones in Noise", by Carney et al. (herein to be referred to as Carney et al.) in view of Rainton (5724485).

In regard to claims 1 and 2, Carney et al. discloses a system for detecting a signal having a target frequency (introduction paragraph) comprising: a first filter having a first center frequency and a first transfer function, wherein said first center frequency is greater than said target frequency (figure of phase vs frequency on pg 1 shows a first filter having a center frequency lower then the target frequency of 900Hz); a second filter having a second center frequency and a second transfer function, wherein said second center frequency is less than said target frequency (figure of phase vs frequency on pg 1 shows a second filter having a center frequency higher then the target frequency of 900Hz) and wherein the phases of said first and second transfer functions differ by 180 degrees about said target frequency (last sentence on pg 1).

Carney et al. lacks wherein a running cross-correlator is interconnected to said first and second filters for comparing first and second transfer functions over time;

Rainton teaches a running cross-correlator interconnected to said first and second filters (fig 1- Cross-correlator (13), filters (11 and 12)) connected to a adaptive

controller for comparing first and second transfer functions over time (abstract; transfer functions are taken into account as they represent the discriminant function).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney et al. to have a cross correlator interconnected to first and second filters and connected to an adaptive controller as taught by Rainton in order to adaptively adjust the respective first and second transfer functions of the first and second filters to minimize the discriminant function (abstract).

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carney et al. in view of Rainton (6031862) as applied to claim 1 above, and further in view of Fullerton et al. (6031862).

Carney as modified lacks wherein the running correlator comprises a cross-correlator having a predefined integration time interconnected to a low pass filter having a frequency that is inversely proportional to the integration time of said cross-correlator.

Fullerton et al. teaches a running cross-correlator having a predefined integration time interconnected (col 17 line 39-45) to a low pass filter (fig 224- Cross-correlator (1408), low pass filter (1428); col 17 line 52-57) having a frequency that is inversely proportional to the integration time of said cross-correlator (col 9 line 60-66).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney as modified by Rainton to incorporate a cross-correlator having a predefined integration time interconnected to a low pass filter having a frequency that is inversely proportional to the integration time of said cross-correlator as

taught by Fullerton et al. in order to detect the received signal in a communication device (col 3 line 47-49).

4. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carney et al., Rainton (5724485), and Fullerton et al. (6031862) as applied to claim 2 above, and further in view of Minto (5757641).

In view of claims 3 and 4, Carney et al. as modified by Rainton and Fullerton et al. lack first and second non-linearities interconnect first and second filter to the cross-correlator; wherein the non-linearities are signum functions.

Minto discloses that each filter comprises a signum function coupled to it (fig 3 (147-filter) (143-signum function)), in order to perform the computation converting each signal to a (+1), (-1), or zero, thus performing a non-linear function to the signal (col 5 line 28-42).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney et al. as modified by Rainton and Fullerton et al. to have a signum function perform a non-linear function on the output of each filter as taught by Minto in order to receive the local channel residual error signal (col 5 line 28-31).

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carney et al. in view of Rainton (5724485) and further in view of Minto (5757641) and further in view of Franklin et al. (4363138).

In regard to claims 5, Carney et al. discloses a method for detecting a signal having a target frequency in noise (introduction paragraph) comprising: a first filter having a first center frequency and a first transfer function, wherein said first center frequency is greater than said target frequency (figure of phase vs frequency on pg 1 shows a first filter having a center frequency lower than the target frequency of 900Hz); a second filter having a second center frequency and a second transfer function, wherein said second center frequency is less than said target frequency (figure of phase vs frequency on pg 1 shows a second filter having a center frequency higher than the target frequency of 900Hz) and wherein the phases of said first and second transfer functions differ by 180 degrees about said target frequency (last sentence on pg 1).

Carney et al. lacks processing the outputs of the filters with saturating non-linearity component that is a signum function; running cross-correlator is interconnected to said the output of the non-linear output; and determining if the signal is present when said running cross-correlation drops below a predetermined threshold.

Minto discloses that each filter comprises a signum function coupled to it (fig 3 (147-filter) (143-signum function)), in order to perform the computation converting each signal to a (+1), (-1), or zero, thus performing a non-linear function to the signal (col 5 line 28-42).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney et al. to have a signum function perform a non-linear function on the output of each filter as taught by Minto in order to receive the local channel residual error signal (col 5 line 28-31).

Rainton teaches a running cross-correlator interconnected to said first and second filters and connected to an adaptive controller (fig 1- Cross-correlator (13), filters (11 and 12)).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney et al. to have a cross correlator interconnected to first and second filters and connected to a adaptive controller, after the non-linearities as from the teaching of Minto (above) for comparing first and second transfer functions of the filters over time as taught by Rainton in order to adaptively adjust the respective first and second transfer functions of the first and second filters to minimize the discriminant function (abstract).

Franklin et al. discloses a threshold detector that connected to the output of a cross-correlator (fig 2 (28-cross-correlator) (29-threshold detector)) and will be able to recover the signal by comparing the output of the cross-correlator to the threshold value (col 5 line 10-19; it is known in the art the original signal would have a lower value after cross correlation therefore be detected when under the threshold value).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney et al. to use a threshold detector to determine the original signal when the cross correlation drops below a threshold as taught by Franklin et al. in order to minimize false alarm probabilities (col 3 line 25-27).

6. Claim 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carney et al., Rainton (5724485), Minto (5757641), Franklin et al. (4363138) as applied to claim 5, and further in view of Fullerton et al. (6031862).

In regard to claim 6, Carney as modified contains as stated above.

Carney as modified by Rainton, Minto, and Franklin et al. lacks wherein the running correlator comprises a cross-correlator having an integration time determined by a low pass filter.

Fullerton et al. teaches a running cross-correlator interconnected to said first and second filters (fig 24- Cross-correlator (1408), low pass filter (1428); col 17 line 39-45); wherein the running correlator comprises a cross-correlator having a integration time determined by a interconnected low pass filter (fig 224- Cross-correlator (1408), low pass filter (1428); col 17 line 52-57).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Carney as modified by Rainton, Minto, and Franklin et al. to incorporate a cross-correlator having a predefined integration time interconnected to a low pass filter as taught by Fullerton et al. in order to detect the received signal in a communication device (col 3 line 47-49).

In regard to claim 7, Carney as modified contains processing said first and second outputs with a saturating non-linearity is performed by a signum function (see above):

Minto discloses that each filter comprises a signum function coupled to it (fig 3 (147-filter) (143-signum function)), in order to perform the computation converting each



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signal to a (+1), (-1), or zero, thus performing a non-linear function to the signal (col 5 line 28-42).

### ***Response to Arguments***

7. Examiner respectfully disagrees with the assessment that Rainton does not provide the motivation or suggestion required for the combination of Carney and Rainton, in the rejections above examiner more precisely explained that Rainton has a cross correlator with an adaptive controller to adjust the respective first and second transfer functions of the filters (the same reason the present application is claiming) to minimize the discriminant function (error). It is at least needed that the adaptive controller in combination with the cross-correlator adaptively adjusts the respective first and second filter to minimize the discriminant function (abstract), not that the adaptive controller can do this by itself as implied by the applicant. It is specifically stated that the cross correlator (13) outputs the discriminant function based on the transfer functions of the filters (col 12 line 60-61). Even if it was required for the adaptive controller to be included with the cross correlator in the combination with Carney to have proper motivation to use a cross correlator apparatus for minimizing the discriminant function (error) as is taught throughout the patent to Rainton, this would still read on the claim since the claim states "a system ... comprising:" and not "a system ... consisting of:".

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Worth noting is that Carney et al. in "Auditory Phase Opponency: A Temporal Model..." cited in the first office action, discloses the use of a cross-correlator for detecting formants in speech sounds in quiet and noise (pg 336 second column and also on pg 344 end of the first column and into the second column)

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Natalini whose telephone number is 571-272-2266. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeff Natalini



**ANJAN DEB**  
**PRIMARY EXAMINER**